



**REQUEST FOR APPLICATIONS #MCC-10-0058-RFA**  
**Malawi Rural Electrification Public-Private Partnership (RE PPP): Mini-Grid**

**[THIS REQUEST FOR APPLICATIONS HAS NOW CLOSED. THE VERSION PROVIDED HEREIN AIMS TO ILLUSTRATE THE MINI-GRID PROJECT AND THE PHASE 2 OPPORTUNITIES THAT MAY EMERGE FOR INVESTORS]**

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## **SECTION I: FUNDING OPPORTUNITY DESCRIPTION**

### **1. Background**

The Millennium Challenge Corporation (MCC) is a Federal Corporation created under Title VI of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 2004. Its mission is to reduce poverty through the promotion of sustainable economic growth. To be eligible to receive MCC foreign aid, a country must demonstrate above-median performance on independent and transparent policy indicators. MCC selects eligible countries for a “Compact” grant. As of March 2010, MCC has signed Compacts ranging from USD 66 million to USD 698 million with twenty partner countries in Africa, Latin America, Asia, and Europe for a total of USD 7.2 billion, of which approximately USD 925 million involves funding for Private Sector Participation-related interventions (See Annex 1).<sup>1</sup>

MCC and the Government of Malawi (GOM), through the Millennium Challenge Account-Malawi (MCA-Malawi), are currently designing an extensive power sector development program that – if approved by MCC’s Investment Committee and Board of Directors – could amount to well over USD 200 million (See Annex 2). Hereafter in this RFA, “MCC” is meant to refer to both MCC and MCA-M.

The proposed Malawi Compact would fund these activities to attain three key objectives:

- *Increased availability of higher quality, more reliable power supply* through: (a) rehabilitation and modernization of two hydropower stations; (b) installation of meters to reduce peak demand growth; (c) rehabilitation and upgrading the transmission and distribution (T&D) system; (d) improved weed and siltation management; and (e) improved protection, control and data acquisition for better power system management.

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<sup>1</sup> As of each Compact signing. This number does not account for reallocations during Compact implementation. See Annex 1 for details.

- *Increased access to quality and reliable power supply to un-served and under-served users* through: (a) rehabilitation of the distribution system; (b) extension to peri-urban areas; and (c) developing decentralized (mini-grid and/or off-grid) power solutions predicated on productive use of electricity, involving private sector participation.
- *Improved and more effectively managed power sector institutions* to support improved service delivery through: (a) implementing a Financial Sustainability Plan for Malawi's electricity parastatal (Escom); and (b) improving Escom's operational efficiency.

## 2. Overview/Phases of Grant Funding Opportunity

This grant funding opportunity targets the second objective for “Increased access to quality and reliable power supply to un-served and under-served users”. Specifically, this opportunity aims for development of three mini-grids in rural areas of Malawi which rely upon renewable sources of power generation. A mini-grid is defined by this requirement as “one integrated generation and distribution system with line capacity of lower than 66KV and generation capacity of 250-4,999 kilowatts that supplies electricity as an autonomous utility independent from the national grid”. The requirement falls directly under the Rural Electrification Act and is also subject to the Energy Regulation Act and Electricity Act (See Annex 5). To expand rural access to electricity, the Malawi Compact could fund one or more mini-grids that meet MCC standards.

There are two Phases to this requirement:

- i. Phase 1: Phase 1 is project development of three mini-grids to attain MCC standards for Compact funding, described below under “Milestone Reporting”; Phase 1 is funded by 609(g), which are project development funds that MCC has allocated for the Malawi Compact. This Phase 1 intends to prove viability of the “mini-grid” concept.
- ii. Phase 2: Phase 2 of this requirement would entail construction, operation, and sourcing of private investment; Phase 2 will be funded by the Compact and is not part of this instant funding opportunity. Also, funding for Phase 2 is subject to the success of Phase 1, the availability of funding, and approval by MCC's Investment Committee and Board of Directors. Once Compact funding is made available, it is anticipated that the successful Applicant for this instant grant (Phase 1) would be requested to submit a follow-on application for Phase 2.

There are three innovations to this requirement for MCC that warrant mention. First, it specifies broad outputs as opposed to inputs, shifting the responsibility of input specification to the recipient. Second, this requirement asks applicants to indicate the level of risk they are willing to assume – within a range – to achieve the outputs. Third, Phase 2 of this requirement would condition milestone payments on sourcing of equity control and private investment at operation; MCC is assuming development and construction risk, but expects private entities to assume operational risk and responsibility to maximize sustainability.

MCC is structuring this requirement as a grant because of the benefits to be provided to the public and energy industry. The grant seeks to enhance the global knowledge base by developing a sustainable model for rural electrification in Malawi and similar countries. MCC will not likely fund a Phase 2 grant for all of the mini-grids that are developed through the Phase 1 grant. MCC

would expect other funders – such as the private sector, GOM, or other donors – to fund those mini-grids that MCC does not fund through the Compact. For those mini-grids MCC does not fund, the recipient would be permitted and encouraged, but not obligated, to obtain Phase 2 funding from other sources.

MCC has annexed five total resources to this RFA: Annex 1 contains a table of private sector participation in signed Compacts; Annex 2 contains more information on MCC and how it is supporting the GOM in the Compact development process; Annex 3 contains a data matrix on five possible mini-grid sites; Annex 4 contains a draft financial and economic model in Microsoft Excel; and Annex 5 contains a list of files available online or upon request.

### 3. Objective

The main objective of this grant is to develop mini-grids in rural Malawi (Phase 1) to achieve the performance goals as specified in the Milestone Chart.

### 4. Milestone Reporting

#### 4.1 Milestone Reports

Milestone Reports shall describe how the Milestones have been achieved. Milestone Reports shall be submitted as each mini-grid is ready. For each Milestone, MCC is able to offer additional guidance to the Grantee to clarify and supplement understanding; however, the general principles codified in the below chart, not the more detailed guidance, will form the basis of evaluation.

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#### 4.3 Milestone Chart

##### Phase 1

Milestone Report(s) for Phase 1 shall demonstrate how each mini-grid achieves all of the following milestones:

Milestone	Factor	Performance Measure(s)
Milestone 1: Economic	Economic Rate of Return	Projected to exceed hurdle rate of 12.4%. Grantee should build on the draft model contained in Annex 4. <sup>2</sup> Adjustments to this model should follow guidelines at <a href="http://www.mcc.gov/mcc/bm.doc/guidance-economicandbeneficiaryanalysis.pdf">http://www.mcc.gov/mcc/bm.doc/guidance-economicandbeneficiaryanalysis.pdf</a> and supplementary guidance contained in Annex 4. All assumptions and benefit streams must be based on realistic logic or evidence, and final results will be verified by MCC's Economic Practice Group.
	Beneficiaries: Rural, Poor, and Distributed	Rural is defined as “in District(s) with no more than 25% population classified as ‘urban’ according to the National Statistics Office of

<sup>2</sup> The grantee takes full responsibility for the model it submits to MCC, including any programming errors that may currently exist.

		Malawi”; Poor is defined as “in District(s) with no less than 25% classified as ‘poor’ according to the National Statistics Office of Malawi”; Distributed is defined as “no one user can consume more than half the total kilowatt-hours produced per year”; as a principle, the electricity users should consist of residential, social, commercial, as well as industrial users (if any).
	Beneficiaries: Gender	Gender Analysis that complies with MCC’s Gender Policy ( <a href="http://www.mcc.gov/mcc/bm.doc/14-genderpolicy.pdf">http://www.mcc.gov/mcc/bm.doc/14-genderpolicy.pdf</a> ) and with GOM gender policy. The Gender Analysis must include analysis of gender constraints, men’s and women’s roles and responsibilities, gender differences in access and control of productive resources, and efficacy of meeting practical needs and strategic gender interests.
Milestone 2: Financial/ Sustainability	Cost recovery; adequate demand and willingness-to-pay; strategy for sustainable operation	Revenues projected to exceed operating costs and enable competitive returns to equity. Grantee should build on draft model contained in Annex 4. Adjustments to this model should follow industry financial modeling practice. Demand analysis should document users’ ability and willingness to pay. Strategy for sustainable operation should specify who will operate the mini-grid and how they will operate it.
	Interest by equity investors	Written (though non-committal) expression(s) of interest by one or more interested equity investors, detailing the necessary conditions for their investment
Milestone 3: Technical	Implementability of Phase 2 within the five-year Compact term, with sufficient float to allow for unforeseen delays (logistics, construction, weather, labor, etc.)	Project schedule accompanied by technical justification
	Completed Schematic Design with cost, ready for execution by a design-build contractor	Conceptual design of the mini-grid indicating the components as well as a site plan, preliminary building plans and sections, user connections, and a cost estimate including generation, distribution, user connections, and associated costs like land acquisition.
Milestone 4: Environmental & Social	Renewable energy: limited to solar, wind, hybrid (solar/wind), hydro, or sustainable biomass (excluding natural gas, coal, and petroleum products, except as supplementary fuel sources should technical and economic	Technical justification. This should demonstrate, at a minimum, how the technology falls into one of these categories and is commercially proven with a robust operating record (based on examples in other countries). In conjunction with the economic modeling, the grantee should identify environmental benefits and costs, such as carbon finance opportunities and GHG emission abatement as categorized by the UNFCCC and/or

	feasibility dictate).	relevant voluntary carbon markets.
	Environmental & Social Screening (by Category A, B, or C) and Preliminary Scoping (including initial cost estimates)	Must comply with MCC's Environmental & Social Guidelines at <a href="http://www.mcc.gov/mcc/bm.doc/20-enviroandsocialassessment.pdf">http://www.mcc.gov/mcc/bm.doc/20-enviroandsocialassessment.pdf</a> and be consistent with international best practices and principles for resettlement as defined by World Bank Operational Policy 4.12 at <a href="http://go.worldbank.org/96LQB2JT50">http://go.worldbank.org/96LQB2JT50</a> . The Screening and Scoping Assessment must: <ul style="list-style-type: none"> <li>• Identify key environmental and social considerations for integration into Phase 2</li> <li>• Preliminary recommendations for the mitigation, management, and monitoring of impacts</li> <li>• Initial estimate of costs for environmental and social management</li> <li>• Initial estimate of the types/categories of resettlement required, the number of project affected people, and potential resettlement costs.</li> <li>• Outline of the relevant regulatory requirements and standards in Malawi</li> </ul>
Milestone 5: Legal, Regulatory, and Policy	Mini-grids are ready for licensing/permitting	Completed license application(s), ready for submission; available from Malawi Energy Regulatory Authority
	Any proposed changes, or exceptions, to GOM legislation, regulations, and policy necessary before Phase 2 commences	Legal, regulatory, and policy annotation with justification. This annotation will feed into a concurrent review by MCC. The necessary reforms would become conditions precedent to Compact funding.
	GOM certification that the site is not earmarked for grid extension	Letter signed by appropriate GOM official. Grantee should cooperate with MCC to obtain this letter.

## Phase 2

MCC shall make a determination to continue this project to Phase 2 after reviewing the Milestone Reports and funding the Malawi Compact. The Applicant will not be authorized to conduct any work under Phase 2 without receiving a request from the MCC Agreement Officer in writing. If MCC obtains approval and determines to move forward on Phase 2, Milestone Report(s) for Phase 2 shall demonstrate how each mini-grid achieves all of the following milestones:

<b>Milestone</b>	<b>Factor</b>	<b>Performance Measure(s)</b>
Milestone 1: Construction	Completion of construction	Certification after inspection by Independent Engineer
Milestone 2: Operation	Six months successful operation	Certification after inspection by Independent Engineer that collection rate is at least 78%, electricity lost in distribution is below 15%, and annualized supply interruptions are below 20.
Milestone 3: Financial Arrangements	Adequate working capital for the operating company	Evidence of working capital, such as a line of credit from a commercial bank or another acceptable financial institution

Milestone 4: Equity Control & Private Investment	Competitively tendered equity control of operating company. Private investment in capital expenditures totaling at least 25% of total Compact/Phase 2 grant investment (or another level mutually agreed by the parties).	Control is defined as “voting majority of the Board of Directors” of the operating company. The private investment can be in the form of equity or debt financing of the initial construction and/or in expansion upon operation, such as new connections, expansion of the generation capacity, and/or extension of the distribution network. If the private investment is in expansion, the mini-grid construction should be phased so that the grant only covers a certain percentage of the total potential capital expenditures.
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## SECTION II: AWARD INFORMATION

### Estimated Grant Funding

The Phase 1 grant ceiling is \$2,000,000. MCC's grant for Phase 1 will not exceed this amount. If additional resources are necessary, the Applicant is encouraged to cost share or leverage funding from other entities.

The grant comprises a Reimbursement Portion and a Milestone Portion, apportioned according to the "Evaluation Criteria" Section, as calculated in the examples below:

- Reimbursement Portion: Using the Budget Categories in Section B of Form SF-424A – titled "Budget Information -Nonconstruction Programs" – the Applicant shall set reimbursement ceilings for each Category. The total reimbursement ceiling should not exceed the Reimbursement Portion of the Phase 1 grant, as calculated in the examples below.
- Milestone Portion:
  - In Phase 1, the Applicant shall receive a Milestone Payment for each of up to three mini-grids that achieve all of the measures listed in the Milestone Chart for Phase 1. These mini-grids may differ from the indicative sites provided in Annex 3. The recipient will receive Milestone Payments regardless of how many mini-grids MCC ultimately approves for Compact funding. See sample below.
  - In Phase 2 – if awarded – the Applicant shall receive a Milestone Payment for each mini-grid that achieves all of the measures listed in the Milestone Chart for Phase 2. However, during Phase 2, the Milestone Payment percentage will apply only to internal personnel costs, not third-party costs such as equipment and construction works.

Examples of 3 ways Apportionment of Reimbursement Portion and Milestone Portion could be proposed in the Application:

*Grant payment if applicant proposes 75% Milestone Portion, leaving 25% Reimbursement Portion:*

Mini-Grid	Reimbursement Portion for all 3 mini-grids	Milestone Portion for each mini-grid
Mini-Grid #1	Grantee may claim up to \$500,000 in reimbursement	\$500,000.00
Mini-Grid #2		\$500,000.00
Mini-Grid #3		\$500,000.00

*Grant payment if applicant proposes 50% Milestone Portion, leaving 50% Reimbursement Portion:*

Mini-Grid	Reimbursement Portion for all 3 mini-grids	Milestone Portion for each mini-grid
Mini-Grid #1	Grantee may claim up to \$1,000,000 in reimbursement	\$333,333.33
Mini-Grid #2		\$333,333.33
Mini-Grid #3		\$333,333.33

*Grant payment if applicant proposes 25% Milestone Portion, leaving 75% Reimbursement Portion:*

<b>Mini-Grid</b>	<b>Reimbursement Portion for all 3 mini-grids</b>	<b>Milestone Portion for each mini-grid</b>
Mini-Grid #1	Grantee may claim up to \$1,500,000 in reimbursement	\$166,666.67
Mini-Grid #2		\$166,666.67
Mini-Grid #3		\$166,666.66

## **SECTION V: APPLICATION REVIEW INFORMATION**

### **1. Evaluation Criteria**

Applications shall be evaluated on the evaluation factors listed below. Factors 1 and 2 are of equal importance and of higher importance than 3 and 4. Factors 3 and 4 are in descending order of importance:

Factor (1) – Technical Approach: Quality & adequacy of the Applicant’s plans for meeting the Milestones

- a.** Describe inputs – such as personnel and technical, legal, and market consultants – the applicant would use to achieve the Phase 1 Milestones;
- b.** Describe the approach the applicant would use to achieve the Phase 2 Milestones, particularly equity control and private investment;

Factor (2) – Milestone Payment:

- a.** Applicants shall propose a percentage of the grant for payment based on milestones (“Milestone Portion”), with the remaining percentage for payment based on reimbursement (“Reimbursement Portion”). The minimum acceptable percentage for the Milestone Portion is 25% (i.e., \$500,000) and the maximum acceptable percentage is 75% (i.e., \$1,500,000). In Phase 1, the Milestone Portion will be divided by three.

Factor (3) – Past Performance:




















- a.** Qualifications – such as projects and skills – of key personnel that compose the applicant’s core team (include resumes or CVs);
- b.** Qualifications – such as projects and capabilities – of the applicant’s organization that could be accessed for this grant (describe at least 3 major projects).

Factor (4) – Price: Cost Effectiveness and Reasonableness of the Application

- a.** This Factor relates to the budget ceilings set for all Budget Categories, pursuant to Section II.1 above.



## Annex 1: Private Sector Participation (PSP) as of Compact Signings\*

COUNTRY	AMOUNT OF PSP	DESCRIPTION OF PSP-RELATED PROJECT/ACTIVITY
 <b>Armenia</b> \$235.7	-	None
 <b>Benin</b> \$307.3	\$169.4 million	<ul style="list-style-type: none"> <li>Port of Cotonou's South Wharf will be concessioned to the private sector after Compact-funded rehabilitation is complete</li> </ul>
 <b>Burkina Faso</b> \$480.9	-	None
 <b>Cape Verde</b> \$110.1	\$58.7 million	<ul style="list-style-type: none"> <li>"Partnership to Mobilize Investment" activity funds identification of potential public/private interventions</li> <li>Compact funding is conditioned on private sector participation in Port of Praia operations</li> </ul>
 <b>El Salvador</b> \$460.9	\$38.0 million	<ul style="list-style-type: none"> <li>Compact provides that MCC funding for technical schools can leverage funding from "private parties"</li> <li>Rural electrification investment co-financed and operated by private power developer</li> </ul>
 <b>Georgia</b> \$295.3	-	None
 <b>Ghana</b> \$547.0	-	None
 <b>Honduras</b> \$215.0	\$4.7 million	<ul style="list-style-type: none"> <li>One or more companies will be contracted to operate weight control stations along major highway CA-5</li> </ul>
 <b>Lesotho</b> \$362.6	\$44.0 million	<ul style="list-style-type: none"> <li>Compact makes funding for renovation of health infrastructure available to an NGO that provides roughly 40% of Lesotho's health services through a combination of user fees and formal subsidy from GoL</li> </ul>
 <b>Mali</b> \$460.8	\$183.9 million	<ul style="list-style-type: none"> <li>Bamako Airport will be operated by the private sector after Compact-funded rehabilitation is complete</li> </ul>
 <b>Moldova</b> \$262.0	-	None
 <b>Mongolia</b> \$284.9	\$25.5 million	<ul style="list-style-type: none"> <li>Compact funds competitive grants program for public-private co-investments in vocational training</li> </ul>
 <b>Morocco</b> \$697.5	\$93.6 million	<ul style="list-style-type: none"> <li>Morocco's National Office for the Fishing Sector will delegate management of wholesale fish markets</li> <li>The Compact will fund a "design competition" and RFP for public-private financed spaces in Fez Medina</li> </ul>
 <b>Mozambique</b> \$506.9	\$194.6 million	<ul style="list-style-type: none"> <li>Water supply networks in large and mid-sized cities will be leased to private operators</li> <li>Water supply networks in smaller cities and towns will be pooled through a management contract</li> </ul>
 <b>Namibia</b> \$304.5	\$58.7 million	<ul style="list-style-type: none"> <li>The tourism project funds a study of tourism enterprises, technical assistance to communal conservancies, and grants for joint ventures between conservancies and the private sector</li> </ul>
 <b>Nicaragua</b> \$175.0	-	None
 <b>Senegal</b> \$540.0	-	None
 <b>Tanzania</b> \$698.1	\$53.7 million	<ul style="list-style-type: none"> <li>Public-private partnership in renewable energy generation, distribution, and/or transmission.</li> </ul>
 <b>Vanuatu</b> \$65.7	-	None
<b>\$924.8M TOTAL</b>		

\*This table is not updated with reallocations during Implementation.

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## **Annex 2: Timeline of Malawi Compact Development& Current Process for Implementation**

In December 2007, the Republic of Malawi qualified for Compact funding. In March 2008, the Government of Malawi (GoM) established the Millennium Challenge Account-Malawi (MCA-M) in the Ministry of Finance, with the mandate of completing and implementing all activities to facilitate the development of the Compact. Since May 2008, the MCA-M Core Team, working in close collaboration with Malawi's development partners and other stakeholders, has completed the initial constraints analysis and developed various projects that were submitted to the MCC in April 2009 for potential investment (see <http://www.mca-m.gov.mw/index.php/home>). MCC and MCA-Malawi are currently conducting due diligence on a power sector development program. Following is MCC's current process of Compact Development and Implementation, with the timeframes for Malawi:

### Stage 1: Proposal Development and Program Design (For Malawi, took place December 2007-April 2009)

Phase 1 provides guidance to eligible countries to develop a proposal for a Compact. During this Phase, countries build a country team, identify the conditions that impede growth and sustain poverty, and initiate a timely and meaningful consultative process with the country's civil society. After the consultative process results in the identification of key constraints to economic growth and poverty reduction, countries develop and submit a proposal to MCC that integrates a range of issues including gender considerations, sustainability, and other donor activities. Countries may require assistance for Compact development activities, and MCC can offer limited financial assistance. The key milestone in Phase I is the submission of an initial proposal to MCC.

### Stage 2: Due Diligence and Program Refinement (For Malawi, ongoing since July 2009; expected to conclude in September 2010)

Once a country has submitted a proposal for MCA funding, MCC will conduct a preliminary assessment of the proposal. It will provide guidance and feedback to the country with respect to MCC objectives, evaluation methods, and requirements. As necessary, MCC will work with the country to refine the proposal. When appropriate, MCC staff will carry out "due diligence", an in-depth review of the country's proposal and the process used to develop it. MCC will also assess the proposal to estimate its distributive impact and measurable increases in incomes of the poor as a result of successful implementation of the proposed program.

### Stage 3: Compact Finalization (For Malawi, would start at Compact negotiations in October-December 2010)

To commence Stage 3, MCC notifies the U.S. Congress, when appropriate, of its intent to enter into negotiations with the country regarding the terms of the Compact. A parallel step in Stage 3 is for a country to establish an Accountable Entity which will be responsible for the implementation of most Compact activities. After negotiations, the Compact is submitted to MCC's Investment Committee for approval and, if approved, to MCC's Board of Directors. Once approved by the Board, MCC notifies Congress of the intention to enter into a Compact. Shortly, thereafter MCC and the MCA country sign the negotiated Compact.

### Stage 4: Mobilization and Start up (For Malawi, would start at Compact negotiations in January 2011 and take up to one year)

Following the Compact signing, a small portion of funds are specifically designated for use before Compact's Entry into Force. The Accountable Entity initiates work with fiscal and procurement

## **Annex 2: Timeline of Malawi Compact Development& Current Process for Implementation**

agents to establish financial and reporting systems, develop standard bidding documents, and begin work on any procurement activities as may be required prior to Entry into Force of the Compact. The Accountable Entity further develops and concludes detailed work plans. During this Phase, the MCC legal team and the country legal counsel finalize all legal documents, including post-Compact agreements such as the disbursement agreement, necessary for a Compact to Enter into Force. Entry into Force and the first disbursement mark the end of Stage 4.

### Stage 5: Implementation

During Stage 4, the Accountable Entity is responsible for overseeing implementation, tracking progress towards poverty reducing outcomes, submitting regular financial and activities reports to the MCC, and keeping the public informed about Compact progress. Countries are subject to reporting requirements, including Quarterly Progress reports, Procurement Performance reports, and Financial reports, throughout the life of the Compact.

### Annex 3: Data on five possible mini-grid sites in Malawi

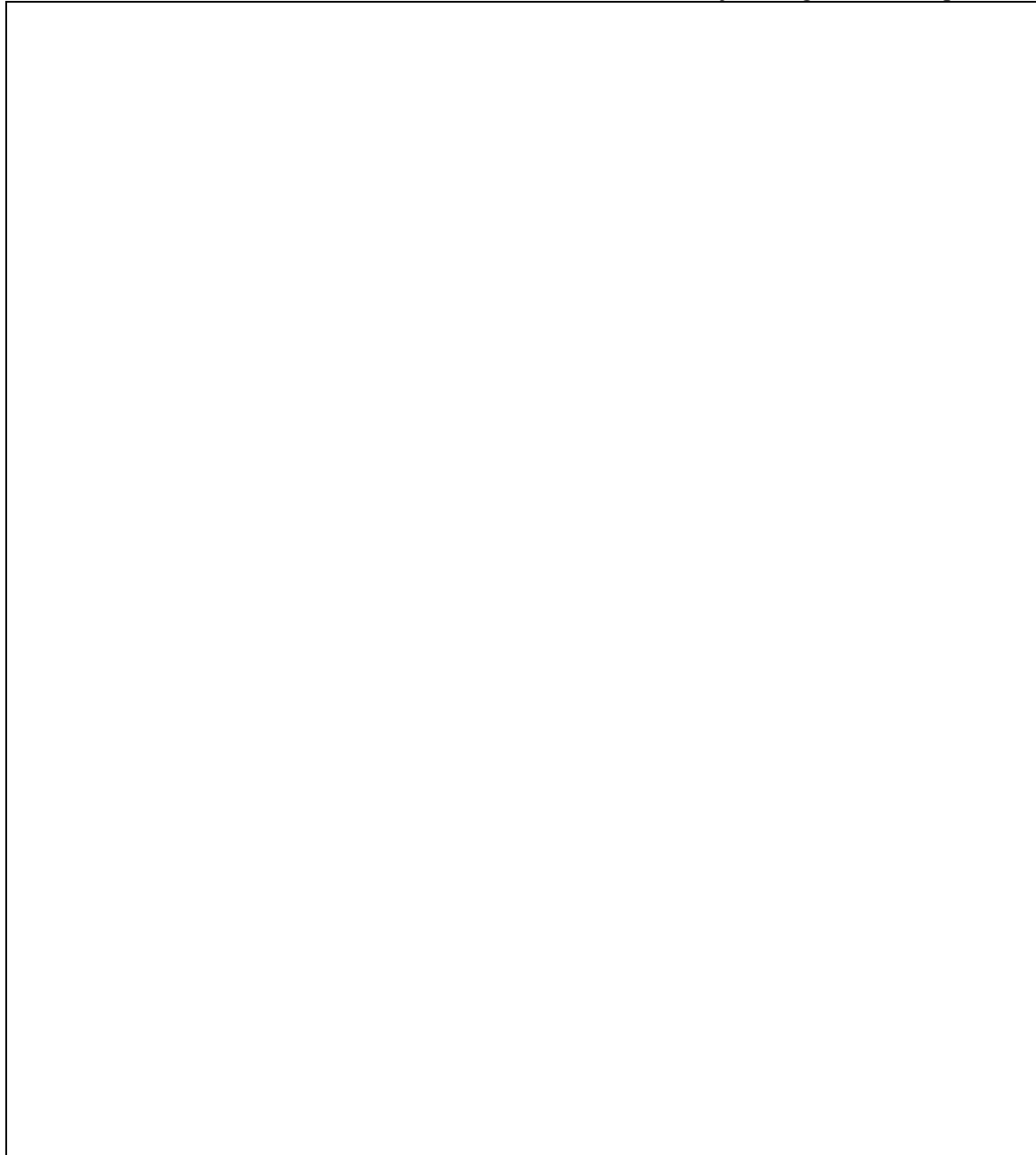
Attribute Site	Lufilya (Karonga District, Northern Region)	Lunyina (Rumphi District, Northern Region)	Likoma Island (Likoma District, Northern Region)	Chizumulu (Likoma District, Northern Region)	Sugar growing trusts (Central Region: Dwangwa, Kabadwa, Green Leaf, Mkangadzinja, Tipate; Southern Region: Kasinthula)
<b>Economic &amp; Financial</b>					
<b>Approximate number of HHs</b>	1,096	600	1,430	557	Varies by trust
<b>Poverty rate in District</b>	44.2% (IHS2)	48.8% (IHS2)	49.6% (IHS2 – proxy Nkhatabay)	49.6% (IHS2 – proxy Nkhatabay)	Dwangwa, Nkhotakota – 37.9% (IHS2) Kasinthula, Chikwawa – 55.4% (IHS2)
<b>Percent population in District urban</b>	14.9%	10.4%	13.0%	13.0%	Varies by trust
<b>Marketable Cash Crops</b>	Rice	Tobacco (sold in US\$), some ground nuts	Cassava, Maize		Sugar
<b>Other businesses</b>	Coal mining: currently 60,000 tons/year but could expand to 100,000 with new equipment that requires reliable electricity; currently use 420 kW diesel generator but needs 1MW electricity	None	Tourism: at least 4 hotels/lodges; Fishing		None
<b>Possible Productive Uses</b>	Rice milling, Irrigation, Coal mining	Tobacco drying	Displacement of diesel in tourism and fishing; Cold storage; maize milling		Irrigation: pumps and pivots
<b>Community Description</b>	Along a 2km road; 300 hectares of rice currently farmed, with potential for 1,000 hectare expansion using irrigation	10 villages of 50-60 people along a 17km road	Likoma and Chizumulu are 10km apart in Lake Malawi. Likoma is approximately 8km long by 3km wide; Chizumulu is smaller. High household density.		Dwangwa, the largest trust, has 356 outgrowers farming 1,200 ha; Kasinthula has 282 outgrowers farming 850 ha
<b>Distance to market</b>	25 km	16/17 km for crops; Tobacco is picked up	70km to mainland (Nkhatabay)	57km to mainland (Nkhatabay)	Varies by trust: Malawi's 2 major cane pressing facilities are at Dwangwa and Nchalo

### Annex 3: Data on five possible mini-grid sites in Malawi

Attribute  Site	Lufilya (Karonga District, Northern Region)	Lunyina (Rumphi District, Northern Region)	Likoma Island (Likoma District, Northern Region)	Chizumulu (Likoma District, Northern Region)	Sugar growing trusts (Central Region: Dwangwa, Kabadwa, Green Leaf, Mkangadzinja, Tipate; Southern Region: Kasinthula)
					(Southern Region). Both are owned by Illovo.
Approx size of individual farm land	1-2 hectares	1+ hectare	0.27 ha	0.27 ha	Averages 3 ha/outgrower
Clinics (public or private)	5	3	1	1	Varies by trust
Schools	5	8	Primary (7) Secondary (2)	Primary (3) Secondary (1)	Varies by trust
Institutional					
Institutions	Potable Water Users Association Irrigation Association	Potable Water Users Association New irrigation association just created Tobacco farmers association	Likoma Water Users Association Likoma District Assembly	Chizumulu Water Users Association Likoma District Assembly	Trusts are well- organized and profitable; 130 ton/ha average yield with sucrose to cane ratio of 13% is on par with large plantations
Technical & Environmental					
Technical	Potential generation capacity of 4-6MW given head and flow	Potential hydro generation capacity of up to 3MW given head and flow	There are four 120kW diesel generators at Likoma. Only two of these are functional, and of these two, one is faulting. 12 km of distribution lines already exist, connecting 610 users.	There are two 112 kW diesel generators at Chizumulu. 5 km of distribution lines already exist, connecting 150 users.	Biomass (using cane leaves and pressed cane), Solar, or Wind
			With power rationing, there are only 14 hours of supply at these islands.		
Resource and location	Hydro – Perennial: Lufilya River	Hydro – Perennial: Lunyina River	Solar (year-round) and Wind (strong)		

#### **Annex 4: Draft Financial and Economic Model with Supplementary Guidance**

The draft model is embedded into this annex as a Microsoft Excel object. Right click to open and edit.



## **Annex 5: Resources**

**(Documents may be provided upon request. E-mail the primary and secondary contacts your request listing the documents to be provided.)**

### Resources Available Upon Request

1. Economist Intelligence Unit Country Report, Feb 10
2. Electricity Act, Apr 04
3. Rural Electrification Act, Apr 04
4. Rural Electrification Act Bylaws, Feb 09
5. Energy Regulation Act, Apr 04
6. Energy Regulation Act Bylaws, Feb 09
7. Gazette notices: Electricity Act, Rural Electrification Act, Energy Regulation Act, Dec 07
8. MCC Analysis of Malawi Energy Laws, Nov 09
9. Malawi National Energy Policy, Jan 03
10. MAREP (Master Plan for Rural Electrification in Malawi), Main Report, Mar 03
11. MAREP (Master Plan for Rural Electrification in Malawi), Technical Annex 1, Mar 03
12. MAREP (Master Plan for Rural Electrification in Malawi), Technical Annex 2, Mar 03
13. MAREP (Master Plan for Rural Electrification in Malawi), Technical Annex 3, Mar 03
14. Follow-Up Study for MAREP (Master Plan for Rural Electrification in Malawi), Sep 04
15. Escom (Malawi) National Electricity Grid
16. Potential Hydropower Sources in Northern Region
17. Household Energy Use in Malawi, Jun 06
18. Government of Malawi Biomass Energy Strategy, Jan 09
19. Accenture-Dalberg Report on Malawi Electrification Opportunities, Dec 09
20. Accenture-Dalberg Dataset of Malawi Electrification Opportunities, Dec 09
21. Mini-Grid Interviewees in Malawi & South Africa, Jun 09
22. Field Report on Potential Mini-Hydro Sites, Aug 09
23. Electricity Needs of Rice Schemes, Feb 10
24. Compact Design Monitoring Framework, Mar 10

### Resources Available Online

1. World Bank ESMAP, Technical and Economic Assessment of Off-grid, Mini-grid and Grid Electrification Technologies, Dec 07,  
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